

to establish launch safety rules as required by §417.113 of this chapter. An applicant's flight safety analysis must satisfy the following requirements:

(1) An applicant must file the proposed flight safety analysis methodology and the preliminary flight safety analysis products no later than 18 months for any orbital or guided suborbital launch vehicle, and nine months for any unguided suborbital launch vehicle, prior to bringing any launch vehicle to the proposed launch site.

(2) For a launch operator license, an applicant must file flight safety analysis products that account for the range of launch vehicles and flight trajectories applied for, or the worst case vehicle and trajectory under which flight will be attempted, no later than 6 months before the applicant brings any launch vehicle to the proposed launch site. For a launch specific license, an applicant must file flight safety analysis products that account for the actual flight conditions, no later than 6 months before the applicant brings any launch vehicle to the proposed launch site.

(3) The flight safety analysis performed by an applicant must be completed as required by subpart C of part 417 of this chapter. An applicant may identify those portions of the analysis that it expects to refine as the first proposed flight date approaches. An applicant must identify any analysis product subject to change, describe what needs to be done to finalize the product, and identify when before flight it will be finalized. If a license allows more than one launch, an applicant must demonstrate the applicability of the analysis methods to each of the proposed launches and identify any expected differences in the flight safety analysis methods among the proposed launches. Once licensed, a launch operator must perform a flight safety analysis for each launch using final launch vehicle performance and other data as required by subpart C of part 417 of this chapter and using the analysis methods approved by the FAA through the licensing process.

(b) *Radionuclides.* An applicant's safety review document must identify the type and quantity of any radionuclide

on a launch vehicle or payload. For each radionuclide, an applicant must include a reference list of all documentation addressing the safety of its intended use and describe all approvals by the Nuclear Regulatory Commission for launch processing. An applicant must provide radionuclide information to the FAA at the pre-application consultation as required by §415.105. The FAA will evaluate launch of any radionuclide on a case-by-case basis, and issue an approval if the FAA finds that the launch is consistent with public health and safety.

(c) *Flight safety plan.* An applicant's safety review document must contain a flight safety plan that satisfies §417.111(b) of this chapter. The plan need not be restricted to public safety related issues and may combine other flight safety issues as well, such as employee safety, so as to be all-inclusive.

(d) *Natural and triggered lightning.* For any orbital or guided suborbital expendable launch vehicle, an applicant must demonstrate that it will satisfy the flight commit criteria of §417.113(c) of this chapter and appendix G of part 417 of this chapter for natural and triggered lightning. If an applicant's safety review document states that any flight commit criterion that is otherwise required by appendix G of part 417 of this chapter does not apply to a proposed launch or series of launches, the applicant's safety review document must demonstrate that the criterion does not apply.

§415.117 Ground safety.

(a) *General.* An applicant's safety review document must include a ground safety analysis report, and a ground safety plan for its launch processing and post-flight operations as required by this section, §417.109 of this chapter, and subpart E of part 417 of this chapter when launching from a launch point in the United States. Launch processing and post-launch operations at a launch point outside the United States may be subject to the requirements of the governing jurisdiction.

(b) *Ground safety analysis.* A ground safety analysis must review each system and operation used in launch processing and post-flight operations as required by §417.109 of this chapter, and subpart E of part 417 of this chapter.

(1) An applicant must file an initial ground safety analysis report no later than 12 months for any orbital or guided suborbital launch vehicle, and nine months for an unguided suborbital launch vehicle, before the applicant brings any launch vehicle to the proposed launch site. An initial ground safety analysis report must be in a proposed final or near final form and identify any incomplete items. An applicant must document any incomplete items and track them to completion. An applicant must resolve any FAA comments on the initial report and file a complete ground safety analysis report, no later than two months before the applicant brings any launch vehicle to the proposed launch site. Furthermore, an applicant must keep its ground safety analysis report current. Any late developing change to a ground safety analysis report must be coordinated with the FAA as an application amendment as required by §413.17 of this chapter as soon as the applicant identifies the need for a change.

(2) An applicant must file a ground safety analysis report that satisfies the ground safety analysis requirements of §417.109 of this chapter, and subpart E of part 417 of this chapter.

(3) The person designated under §417.103(b)(1) of this chapter and the person designated under §417.103(b)(2) of this chapter must approve and sign the ground safety analysis report.

(c) *Ground safety plan.* An applicant's safety review document must contain a ground safety plan that satisfies §417.111(c) of this chapter. The applicant must file this plan with the FAA no later than six months prior to bringing the launch vehicle to the proposed launch site. This ground safety plan must describe implementation of the hazard controls identified by an applicant's ground safety analysis and implementation of the ground safety requirements of subpart E of part 417 of this chapter. A ground safety plan must address all public safety related issues and may include other ground

safety issues if an applicant intends it to have a broader scope.

§415.119 Launch plans.

An applicant's safety review document must contain the plans required by §417.111 of this chapter, except for the countdown plan of §417.111(1) of this chapter. An applicant's launch plans do not have to be separate documents, and may be part of other applicant documentation. An applicant must incorporate each launch safety rule established under §417.113 of this chapter into a related launch safety plan.

§415.121 Launch schedule.

An applicant's safety review document must contain a generic launch processing schedule that identifies each review, rehearsal, and safety critical preflight operation to be conducted as required by §§417.117, 417.119, and 417.121 of this chapter. The launch schedule must also identify day of flight activities. The launch processing schedule must show each of these activities referenced to liftoff, such as liftoff minus three days.

§415.123 Computing systems and software.

(a) An applicant's safety review document must describe all computing systems and software that perform a safety-critical computer system function for any operation performed during launch processing or flight that could have a hazardous effect on the public as required by §417.123 of this chapter.

(b) An applicant's safety review document must list and describe all safety-critical computer system functions involved in a proposed launch, including associated hardware and software interfaces. For each system with a safety-critical computer system function, an applicant's safety review document must:

(1) Describe all safety-critical computer system functions, including each safety-critical interface with any other system;

(2) Describe all systems, including all hardware and software, and the layout of each operator console and display;

(3) Provide flow charts or diagrams that show all hardware data busses,